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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/546,008	06/26/2006	Akihiko Tanioka	125080	8551

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EXAMINER	
PARKER, FREDERICK JOHN	
ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
11/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/546,008	TANIOKA ET AL.	
	Examiner	Art Unit	
	Frederick J. Parker	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *25 and 26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2-21-06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

2. Applicant's election with traverse of claims 1-24,27 in the reply filed on 8-25-09 is acknowledged. The traversal is on the ground(s) that the presence of a plurality of X references on the International Search Report does not somehow satisfy the requirement that the invention does not define a contribution to the art. This is not found persuasive because 1) the Examiner's reasoning is within the requirements for citing Unity, 2) Applicants do not deny the presence of a plurality of X references on the International Search Report, and 3) further it is not denied that the plurality of X references on the International Search Report were improper or incorrect. The Examiner maintains they meet the requirements of PCT and MPEP rules. The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1,2,5,21,22,23,27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claims 1 & 27 are vague and indefinite because they require a substrate object which "has an arbitrary shape", contrary to both the need to provide utility/ functionality and the specific substrates of claim 5 where clearly an arbitrary shape cannot be specific, as in claim 5; For examination, the shape need be any shape which is functionally coated.
- Claim 2; "average particle size" lacks antecedent basis, and further no particles are required by the method because it cites use of a "solution" rather than dispersion, emulsion, etc.
- Claim 5 is vague and indefinite because the relative term "fine" fails to convey the intended size; it is undefined; and it would not be comprehensible with certainty by the skilled artisan.
- Claim 21 is vague and indefinite because the meaning of "tolerative" in context is unclear; for examination, it will be assumed to mean compatible with the coating substance.
- Claim 22 is vague and indefinite because "converge" in context is unclear; for examination, it will be assumed to mean to transport/ propel the substance to the object to be coated.
- Claim 23, "case" lacks antecedent basis.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1,2,5,12,14-18,21,22 are rejected under 35 U.S.C. 102(b) as being anticipated by Seaver US 4748043.

Seaver teaches an electrospray coating method utilizing a liquid containing a functional coating substance which is fed to at least 1 capillary needle 11 to which a voltage is applied to break up liquid droplets to form a charged mist. Since substrate 30 (same meaning as "object") is of opposite polarity, the formed electric field E2 between the capillary/ies and the substrate directs/transports droplets to the substrate where they spread to form the "desired coating" (col. 5,9- col. 6,33; fig. 4 and associated text; etc), per claim 22. As in the Examples and elsewhere, the intended functionality/ utility of the substance is maintained after deposition of the coating, e.g. as a primer, lubricant, etc, and which is "immobilized" (that is, fixed or impeded from movement) on the substrate as an essentially dry coating (col. 7, 56-63 and elsewhere). Such coatings inherently possess a microstructure. Coatings are on the order of nm (col. 2, 55-61, etc) Thus Seaver meets and anticipates the limitations of claim 1.

Substrates may be conductive, col. 5 58-59, porous col. 7, 66; poorly conductive polymers (examples) per claim 5, etc.

Adjustment of flow rate to provide predetermined liquid volume is disclosed on col. 6, 44-50 per claim 14; and control of voltages applied to the liquid being dispensed is on col. 5-6 and elsewhere, per claim 15.

Capillary needles of metal (col. 4, 18-20) per claim 16 have an ID of 300 microns (per claim 12).

Multiple capillaries are disclosed on col. 3-4 and figures, and the voltage applied to needle/s 11 applies force to the liquid at the tip by adjustment of the power supply V1 per claim 17. Further liquid is fed to manifold 15 via line 16 and tee 17 for distribution to capillaries, per claim 18.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 3,4,6,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver, cited for the same reasons previously discussed, which are incorporated herein.

Seaver explicitly forms solutions of organic objective materials (e.g. EX. 1-3) in specific formulations which the person of ordinary skill would have developed and recognized to have an average molecular weight, which would have been taken into account during formulation. Since time of coating application of a given solution is directly related to thickness, development of curves for rapid determination of time for a specific thickness would have been obvious, per claim 4.

Seaver further teaches on col. 6, 59+ to neutralize charge on the coated substrate using a "neutralizing head 48". Hence the use of functionally equivalent known means to perform the same function, such as that of claim 6 would have been an obvious variation because substitution of one for the other would have been expected to produce equivalent results. As to claim 20, it would have been apparent that voltage is intermittently applied, both during turning ON/OFF of the voltage and during optimization of voltage to a capillary, the variations being to carry out the breaking up of liquid droplets to form a charged mist

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Seaver by forming desired coating solutions utilizing conventional parameters, applying a specific solution for a specific time to obtain a thickness as determined from an empirically derived curve, and utilizing equivalent neutralization means for the coated substrate because such variations would have been within the purview of one skilled in the art and therefore fail to patentably distinguish over prior art.

11. Claims 10,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver, cited for the same reasons previously discussed which are incorporated herein, in view of Morozov et al Analy. Chem. 1999.

Seaver does not teach oscillating the capillary or means for improving coating coverage. Morozov teaches an electrospray deposition method using capillary means with a charging electrode (Fig. 1 and accompanying text), in which it is further taught to enclose the coating apparatus in a chamber to protect against dust and control gas composition. The use of periodically oscillating the capillaries to improve coating coverage is noted on page 3115/right, as is the use of a rotating substrate, so as to allow relative movement of the capillary and substrate to equalize deposition density. It is explicitly stated on top right column on page 3116 that the "proper choice of the ESD conditions allows the elimination of damage and the obtinal of nearly 100% preservation of (coating) activity", in this case for enzymes.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Seaver by incorporating the chamber, oscillating capillary/ies and rotating substrate of Morozov to equalize deposition density and prevent particle contamination/ control gas composition.

12. Claims 23,24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver, cited for the same reasons previously discussed which are incorporated herein, in view of Kim et al US 5344676.

Kim teaches yet another similar method of electrospray coating to form charged nanodrops which are then electrostatically attracted to and adhered to substrates. It is further disclosed to

enclose the coating apparatus to allow the process to be carried out at lower or higher than ambient pressures, as well as in specific atmospheres (e.g. nitrogen, inert, oxygen, etc), depending upon the desired reaction (col. 4/5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Seaver by incorporating the chamber space in which the coating process takes place in a desired atmosphere or reduced pressure in order to provide the conditions required to form a coating with a desired function.

13. Claims 7-9,27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver, cited for the same reasons previously discussed which are incorporated herein, in view of Laymann US 2003/0215624.

Seaver does not teach forming fibers. However, Laymann teaches that even as of 2002 it was already conventional to electrospin polymeric fibers using the system in [005] in which linear polymeric material fibers are spun from electrospray nozzles, wherein the formed fibers are directed against a rotating metal substrate on to which fibers are wound . Details of the materials and the process for specific compositions are provided throughout the patent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Seaver by utilizing materials and incorporating conditions as disclosed by Laymann to form electrospun fibers onto rotating or other substrates because it was a process well-known in the prior art before the claimed invention was made.

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver, cited for the same reasons previously discussed which are incorporated herein, in view of Simonsson US 2003/0164709.

Adjusting voltages and use of an amp meter are not explicitly discussed, though it is the Examiner' position that such steps would have been no more than optimization by routine experimentation to achieve a desired electrospray condition. Use of an amp meter to quantify such conditions is disclosed in an analogous electrostatic spray method as disclosed by Simonsson (abstract and throughout text), so that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Seaver by optimizing voltages and utilizing the amp meter of Simonsson to quantify conditions which produce a desired spray condition .

15. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver, cited for the same reasons previously discussed which are incorporated herein, in view of Dawson US 5303441.

While Seaver does not explicitly teach the multiple capillaries have their own valves, Dawson teaches an electrostatic spray system in which a series of capillaries which deliver coating liquid to a capillary outlet each have their own valves for controlling opening and closing of individual valves to admit and expel discrete amounts of fluid so that each outlet is independent of the characteristics of other outlets. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Seaver by incorporating individual

valves disclosed by Dawson to the plurality of capillaries of Seaver to allow independent operation of the capillaries.

Conclusion

Claims 1-24,27 are anticipated or obvious over the prior art, the obviousness rejections reflecting combinations of variations either already known in the prior art and therefore provide predictable results, or would have been readily apparent to one skilled in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571/272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Frederick J. Parker

Primary Examiner
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